Journal of Limnology 2017 vol.76 N2, pages 272-280

Predicting the invasive potential of the cladoceran Daphnia lumholtzi Sars, 1885 (Crustacea: Cladocera: Daphniidae) in the Neotropics: Are generalists threatened and relicts protected by their life-history traits?

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Abstract

© 2017, Page Press Publications All rights reserved. Invasive species are one of the major threats to biodiversity, which is aggravated in poorly known groups, such as cladocerans. Daphnia lumholtzi Sars (Cladocera: Anomopoda: Daphniidae) is currently invading the Neotropical region, and there are few records of this process. Our goal was to predict the invasive scenario for D. lumholtzi in the Neotropics using species distribution modelling and to assess the climatic overlap of the invader with the native species. We trained our MaxEnt model using occurrence records from native and invaded areas and projected it in the Neotropics. Additionally, we compared the climatic niche of some native species with the invader's niche. Our model showed high environmental suitability in areas connected by the lowland Paraná River Basin (southwestern Brazil, eastern Argentina and Uruguay), in south-central Chile and Atlantic coastal areas. Widely distributed native species showed climatic overlap with the invader, while relict species did not. Daphnia lumholtzi thrives in warm and stable environments (e.g. the Paraná River basin), which of concern because the invader could already be spreading in that area. Native species could suffer due to climatic niche similarity, while natural barriers and local environmental conditions may protect relict species. We urge the need for further studies to understand this invasion process more fully.

http://dx.doi.org/10.4081/jlimnol.2016.1571

Keywords

Biodiversity conservation, Dispersion, Invasive species, Paraná river basin, Reservoirs, Species distribution model

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